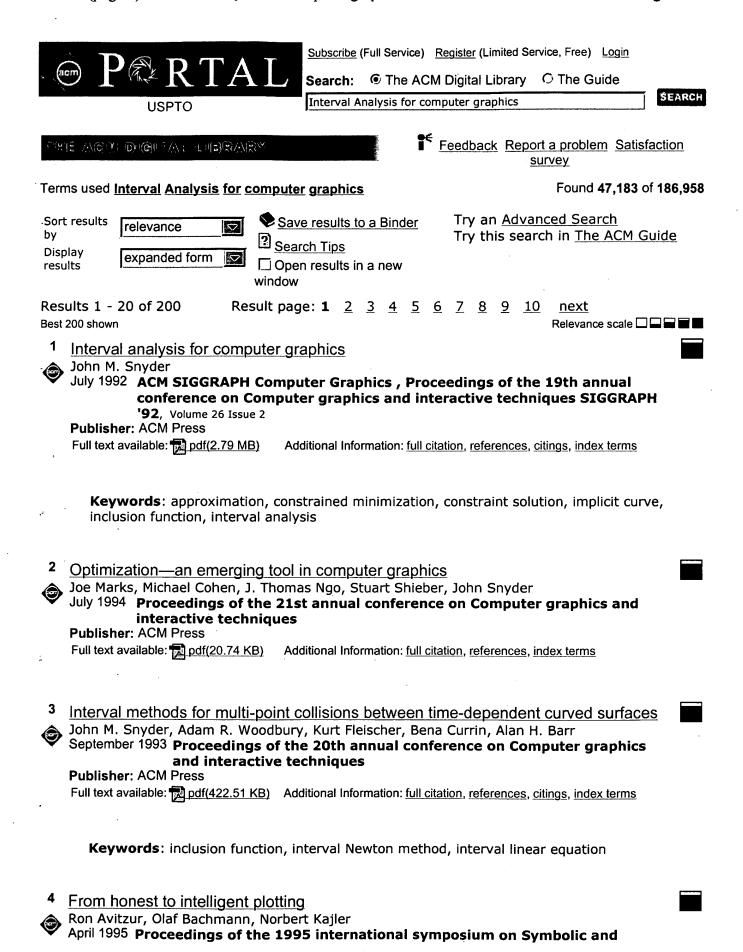
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	L11	photorealistic same image and non-linear same (function or equation) same implicit	0
	L10	photorealistic same image and non-linear same (function or equation) and interval same analysis	0
. 🗆	L9	photorealistic same synthesis and non-linear same (function or equation) and interval same analysis	0
	L8	visible and non-linear with (function or equation) and interval with analysis and parametric same value and (split or splitting or subdivision)	1
	L7	photorealistic and visible and non-linear with (function or equation) and interval with analysis and parametric same value and (split or splitting or subdivision)	0
. 🗖	L6	rectangular same array and parametric and non-linear same (function or equation) and interval same analysis	4
	L5.	345/582.ccls.	985
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	L3	345/421.ccls.	490
	L2	345/426.ccls.	792
	L1	345/419.ccls.	2617

END OF SEARCH HISTORY



## algebraic computation

**Publisher: ACM Press** 

Additional Information: full citation, references, citings, index terms Full text available: pdf(1.28 MB)

5 Sampling procedural shaders using affine arithmetic

Wolfgang Heidrich, Philipp Slusallek, Hans-Peter Seidel
July 1998 ACM Transactions on Graphics (TOG), Volume 17 Issue 3

Publisher: ACM Press

Additional Information: full citation, abstract, references, citings, index Full text available: pdf(590.82 KB)

terms

Procedural shaders have become popular tools for describing surface reflectance functions and other material properties. In comparison to fixed resolution textures, they have the advantage of being resolution-independent and storage-efficient. While procedural shaders provide an interface for evaluating the shader at a single point, it is not easily possible to obtain an average value of the shader together with accurate error bounds over a finite area. Yet the ability to compute ...

**Keywords**: affine arithmetic

Real-time shading

Marc Olano, Kurt Akeley, John C. Hart, Wolfgang Heidrich, Michael McCool, Jason L. Mitchell, Randi Rost

August 2004 ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04

**Publisher: ACM Press** 

Full text available: pdf(7.39 MB) Additional Information: full citation, abstract

Real-time procedural shading was once seen as a distant dream. When the first version of this course was offered four years ago, real-time shading was possible, but only with oneof-a-kind hardware or by combining the effects of tens to hundreds of rendering passes. Today, almost every new computer comes with graphics hardware capable of interactively executing shaders of thousands to tens of thousands of instructions. This course has been redesigned to address today's real-time shading capabili ...

7 Cellular texture generation

Kurt W. Fleischer, David H. Laidlaw, Bena L. Currin, Alan H. Barr

September 1995 Proceedings of the 22nd annual conference on Computer graphics and interactive techniques

Publisher: ACM Press

Full text available: pdf(268.98 KB)

를 ps(5.03 MB)

Additional Information: full citation, references, citings, index terms

**Keywords**: bump mapping, constraints, data amplification, developmental models, displacement mapping, particle systems, texture mapping

8 Reliable two-dimensional graphing methods for mathematical formulae with two free



variables

Jeff Tupper

August 2001 Proceedings of the 28th annual conference on Computer graphics and interactive techniques

Publisher: ACM Press

Full text available: pdf(1.12 MB) Additional Information: full citation, abstract, references, index terms

This paper presents a series of new algorithms for reliably graphing two-dimensional implicit equations and inequalities. A clear standard for interpreting the graphs generated by two-dimensional graphing software is introduced and used to evaluate the presented algorithms. The first approach presented uses a standard interval arithmetic library. This approach is shown to be faulty; an analysis of the failure reveals a limitation of standard interval arithmetic. Subsequent algorithms are deve ...

**Keywords**: GrafEq, Tupper interval arithmetic, algebraic curves, formula graphing, graphing, implicit curves, interval analysis, interval arithmetic, relation graphing

9 Guaranteeing the topology of an implicit surface polygonization for interactive



modeling

Barton T. Stander, John C. Hart

August 1997 Proceedings of the 24th annual conference on Computer graphics and interactive techniques

Publisher: ACM Press/Addison-Wesley Publishing Co.

Full text available: pdf(372.49 KB) Additional Information: full citation, references, citings, index terms

**Keywords**: Morse theory, catastrophe theory, critical points, implicit surfaces, interactive modeling, interval analysis, particle systems, polygonization, topology

10 Rendering CSG models with a ZZ-buffer



David Salesin, Jorge Stolfi

September 1990 ACM SIGGRAPH Computer Graphics, Proceedings of the 17th annual conference on Computer graphics and interactive techniques SIGGRAPH '90, Volume 24 Issue 4

Publisher: ACM Press

Full text available: pdf(2.32 MB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index</u> terms

The ZZ-buffer is a simple acceleration scheme for ray tracing that can be applied to a wide variety of scenes, including those with small features, textured and transparent surfaces, shadows and penumbrae, and depth-of-field effects. In this paper, we describe how the ZZ-buffer algorithm can be adapted to the rendering of scenes defined by constructive solid geometry operations.

11 Interval arithmetic recursive subdivision for implicit functions and constructive solid



geometry

Tom Duff

July 1992 ACM SIGGRAPH Computer Graphics , Proceedings of the 19th annual conference on Computer graphics and interactive techniques SIGGRAPH

**'92**, Volume 26 Issue 2

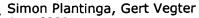
Publisher: ACM Press

Full text available: pdf(2.45 MB)

Additional Information: full citation, references, citings, index terms

**Keywords**: anti-aliasing, collision detection, compositing, computer-aided animation, dynamic simulation, image synthesis, recursive subdivision

12 Motions & transformations: Contour generators of evolving implicit surfaces





Publisher: ACM Press

Full text available: pdf(778.08 KB) Additional Information: full citation, abstract, references, index terms

The contour generator is an important visibility feature of a smooth object seen under parallel projection. It is the curve on the surface which seperates front-facing regions from back facing regions. The apparent contour is the projection of the contour generator onto a plane perpendicular to the view direction. Both curves play an important role in computer graphics. Our goal is to obtain fast and robust algorithms that compute the contour generator with a guarantee of topological correctness. ...

Keywords: contour generators, evolving surfaces, guaranteed topology, implicit surfaces, interval arithmetic, singularities

13 Combining edges and points for interactive high-quality rendering

Kavita Bala, Bruce Walter, Donald P. Greenberg

July 2003 ACM Transactions on Graphics (TOG), Volume 22 Issue 3

**Publisher: ACM Press** 

Full text available: pdf(4.52 MB) Additional Information: full citation, abstract, references, index terms

This paper presents a new interactive rendering and display technique for complex scenes with expensive shading, such as global illumination. Our approach combines sparsely sampled shading (points) and analytically computed discontinuities (edges) to interactively generate high-quality images. The edge-and-point image is a new compact representation that combines edges and points such that fast, table-driven interpolation of pixel shading from nearby point samples is possible, while respe ...

Keywords: interactive software rendering, silhouette and shadow edges, sparse sampling and reconstruction

14 Interval constraint solving for camera control and motion planning

Frédéric Benhamou, Frédéric Goualard, Éric Languénou,, Marc Christie

October 2004 ACM Transactions on Computational Logic (TOCL), Volume 5 Issue 4

Publisher: ACM Press

Full text available: pdf(1.68 MB) Additional Information: full citation, abstract, references, index terms

Many problems in robust control and motion planning can be reduced to either finding a sound approximation of the solution space determined by a set of nonlinear inequalities, or to the "quaranteed tuning problem" as defined by Jaulin and Walter, which amounts to finding a value for some tuning parameter such that a set of inequalities be verified for all the possible values of some perturbation vector. A classical approach to solving these problems, which satisfies the strong soundness requi ...

Keywords: Camera control, inner approximation, interval constraint, universal quantifier

15 Rhythmic-motion synthesis based on motion-beat analysis

Tae-hoon Kim, Sang Il Park, Sung Yong Shin July 2003 ACM Transactions on Graphics (TOG), Volume 22 Issue 3

Publisher: ACM Press

Additional Information: full citation, abstract, references, citings, index Full text available: pdf(6.29 MB)

## terms

Real-time animation of human-like characters is an active research area in computer graphics. The conventional approaches have, however, hardly dealt with the rhythmic patterns of motions, which are essential in handling rhythmic motions such as dancing and locomotive motions. In this paper, we present a novel scheme for synthesizing a new motion from unlabelled example motions while preserving their rhythmic pattern. Our scheme first captures the motion beats from the example motions to extract ...

**Keywords**: beat analysis, motion blending, motion signal processing, motion synchronization, motion synthesis, motion transition

On ray tracing parametric surfaces

Dani

Daniel L. Toth

July 1985 ACM SIGGRAPH Computer Graphics, Proceedings of the 12th annual conference on Computer graphics and interactive techniques SIGGRAPH '85. Volume 19 Issue 3

Publisher: ACM Press

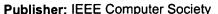
Full text available: 🔁 pdf(2.47 MB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index</u> <u>terms</u>

A new method for ray tracing parametric surfaces is presented. The new algorithm solves the ray surface intersection directly using multivariate Newton iteration. This provides enough generality to render surfaces which could not be ray traced using existing methods. To overcome the problem of finding a starting point for the Newton algorithm, techniques from Interval Analysis are employed. The results are presented in terms of solving a general nonlinear system of equations f(x) = 0, and thus ca ...

Keywords: Newton's method, parametric surfaces, ray tracing

Session P6: level sets and isovalues: Exploring scalar fields using critical isovalues Gunther H. Weber, Gerik Scheuermann, Hans Hagen, Bernd Hamann October 2002 Proceedings of the conference on Visualization '02



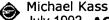
Full text available: pdf(2.43 MB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index</u> terms

Isosurfaces are commonly used to visualize scalar fields. Critical isovalues indicate isosurface topology changes: the creation of new surface components, merging of surface components or the formation of holes in a surface component. Therefore, they highlight "interesting" isosurface behavior and are helpful in exploration of large trivariate data sets. We present a method that detects critical isovalues in a scalar field defined by piecewise trilinear interpolation over a rectilinear grid and ...

**Keywords**: critical point, data exploration, isosurfaces, marching cubes, scalar field topology, volume visualization

18 CONDOR: constraint-based dataflow



July 1992 ACM SIGGRAPH Computer Graphics, Proceedings of the 19th annual conference on Computer graphics and interactive techniques SIGGRAPH

'92, Volume 26 Issue 2

Publisher: ACM Press

Full text available: pdf(3.68 MB)

Additional Information: full citation, references, citings, index terms

Keywords: constraints, dataflow, graphical programming, optimization

19 Efficient solving of quantified inequality constraints over the real numbers

Stefan Ratschan

October 2006 ACM Transactions on Computational Logic (TOCL), Volume 7 Issue 4

Publisher: ACM Press

Full text available: pdf(227.75 KB) Additional Information: full citation, abstract, references, index terms

Let a quantified inequality constraint over the reals be a formula in the first-order predicate language over the structure of the real numbers, where the allowed predicate symbols are ≤ and <. Solving such constraints is an undecidable problem when allowing function symbols such sin or cos. In this article, we give an algorithm that terminates with a solution for all, except for very special, pathological inputs. We ensure the practical efficiency of this algorithm by employing constraint ...

Keywords: Constraint solving, decision procedures, numerical constraints

20 Efficient exact arithmetic for computational geometry



Steven Fortune, Christopher J. Van Wyk

July 1993 Proceedings of the ninth annual symposium on Computational geometry

Publisher: ACM Press

Full text available: pdf(982.06 KB)

Additional Information: full citation, abstract, references, citings, index terms

We experiment with exact integer arithmetic to implement primitives for geometric algorithms. Naive use of exact arithmetic—either modular or multiprecision integer increases execution time dramatically over the use of floating-point arithmetic. By combining tuned multiprecision integer arithmetic and a floating-point filter based on interval analysis, we can obtain the effect of exact integer arithmetic at a cost close to that of floating-point arithmetic. We describe an experi ...

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